ARMY GROUND COMBAT MODERNIZATION FOR THE 1980s: POTENTIAL COSTS AND EFFECTS FOR NATO

Congress of the United States Congressional Budget Office

NOTES

Unless otherwise indicated, all years referred to in this paper are fiscal years. Likewise, unless otherwise noted, all dollar amounts are expressed in inflated dollars.

PREFACE

As the Congress considers the defense budget for fiscal years 1983 and 1984, one important issue will be the Army's equipment modernization. The Administration is proceeding with a major investment program to improve ground combat capabilities by upgrading or replacing existing weapons systems. Congressional decisions on these programs will depend on the effects of modernization on the balance of NATO and Warsaw Pact forces and on the money needed to achieve these effects. Prepared at the request of the House Committee on Appropriations, Subcommittee on Defense, this study analyzes these issues. In addition, it analyzes the growth in Army operating costs that would attend modernization, a topic that has been of concern to defense subcommittees in both the Senate and the House of Representatives.

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SUMMARY

The Warsaw Pact alliance, the principal opponent confronting NATO, has recently made significant gains in conventional ground combat weaponry, and evidence suggests these advances will continue throughout this decade. In response to the growth of the perceived Warsaw Pact threat, all member nations of NATO have committed themselves to programs that would upgrade their own nonnuclear capabilities. Provisions of a NATO agreement signed in 1977 stipulate that each member nation pledge to increase real annual defense spending by 3 percent. Fiscal pressure, especially on Western European governments, has made attainment of that goal difficult, however. Whereas the Congress would prefer to see our allies shoulder a larger share of the burden of defending NATO, economic realities may leave the major responsibility to the United States in the near term, and in particular, to the U.S. Army.

THE ADMINISTRATION PLAN FOR ARMY GROUND COMBAT MODERNIZATION

The U.S. Department of Defense, initially under previous Administrations and now under the Reagan Administration, has formulated plans to make major investments in ground combat material for the Army. The ground combat equipment modernization sought by this Administration would improve or displace outmoded weapons systems at a total cost of \$37.6 billion over the five-year period 1983-1987. Most of this sum would go to acquire

- o 5,096 M1 tanks at a total five-year cost of \$13.3 billion,
- o 3,897 M2 Fighting Vehicle Systems (FVS) for \$8 billion,
- o 221 Multiple Launch Rocket Systems (MLRS) for \$2.8 billion,
- o 435 Apache Attack Helicopters (AH-64) for \$5.6 billion, to be equipped with 29,076 Hellfire Missiles, for \$1.4 billion,
- o 568 Division Air Defense (DIVAD) guns for \$3.6 billion, and
- o 208 applications of the Army Helicopter Improvement Program (AHIP), which would upgrade existing OH 58 scout/observation helicopters at a total cost of \$1.3 billion.

The \$37.6 billion would also put two more divisions in the POMCUS program, which prepositions heavy Army equipment in Europe to speed the deployment of divisions stationed in the United States should a war occur. The high cumulative cost of this procurement package (which excludes another \$10 billion to be spent for tactical nuclear and other improved capabilities), as well as the tight constraints now affecting the federal budget, have given rise to questions about what gains in defense capabilities the program can buy and how much can be purchased for less.

POTENTIAL EFFECTS OF GROUND FORCE MODERNIZATION

Analysis of the effects of modernization indicates that, by the end of 1987, U.S. Army capabilities will be improved by 35 percent over 1980 levels if the Administration's program proceeds as planned. The West Germans, too, expect to accomplish significant improvements in ground force capabilities. In view of the uncertainties in other allies' modernization efforts, however, the overall NATO-wide force improvement is not projected to exceed 23 percent over 1980 levels. According to the Congressional Budget Office's analysis, if the Pact continues to modernize at current rates, this degree of improvement will keep the ratio of NATO forces to Pact forces roughly even. In other words, even the commitment of \$37.6 billion would leave the status quo unchanged. Moreover, under scenarios often used to analyze ground engagements, this status quo might not yield the ratio of forces the Army believes is required for a successful defense.

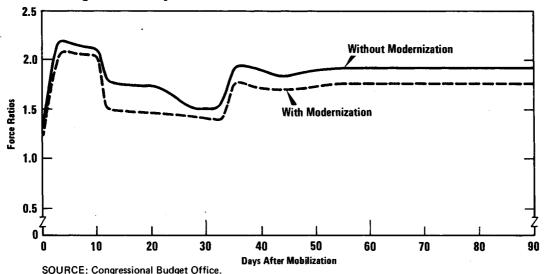
Trends in Force Ratios

The NATO alliance seeks to achieve a military posture strong enough to allow it, should the Pact initiate an attack, to hold the continuous defensive line that it maintains in peacetime. To accomplish this defense, the Army believes that NATO must maintain a ratio of Pact to NATO forces of 1.5:1 or less throughout the European theater. In the local area under attack, the ratio should be 3:1 or lower.

The theater-wide Pact advantage could rise above 1.5:1 at two phases within the first three months after a mobilization. Within the first ten days, a Pact advantage of 1.65:1 could result from NATO's need to move forces from peacetime positions and take up new stations. The arrival of reinforcements from the United States could soon begin to reverse that Pact edge. Within roughly four weeks, however, the Pact forces could restore and retain their initial advantage with the addition of their own reinforcements. A force ratio of roughly 1.7:1 could characterize the buildup from day 40 on (see Summary Figure).

Summary Figure

Effects of Modernization on Force Ratios in Europe's Central Region 90 Days After Mobilization: 1987



NOTES: Assumes continuation of Warsaw Pact modernization at current rates and completion of U.S. Administration and West German modernization programs. Includes U.S. augmentation of POMCUS to six division sets.

Results would be worse if the Pact only, and not NATO, continued to modernize. The CBO analysis suggests that, without NATO modernization and particularly, without fortification of the sizable U.S. role, the Pact advantage could grow. The total theater-wide ratio could worsen to 1.9:1.

Assessing Force Effectiveness

This assessment derives from an analysis based on "armored division equivalents" (ADEs), an analytical tool devised by the Defense Department to reflect both numbers and combat qualities of weapons. Being a purely numerical gauge, the ADE cannot illustrate certain but unquantifiable influences such as tactical skill, personnel morale, and weather that can profoundly affect the outcome of a war. In addition, such analysis depends on assumptions that are best guesses, not certainties. The CBO analysis assumes, as the Defense Department commonly does, that NATO could detect a Pact mobilization and would decide to mobilize its forces within four days. The analysis also assumes that the Pact would commit 120 divisions against NATO, about half the divisions now available to the Pact alliance. Another key assumption, which seems particularly uncertain in

light of current political events in Eastern Europe, is that the forces of all member nations of the Warsaw Pact alliance would operate in concert.

COST-CUTTING APPROACHES TO ARMY GROUND COMBAT MODERNIZATION

The size of the federal deficit, currently projected by CBO to be \$155 billion in 1983, is prompting consideration of cost-cutting measures in virtually all program areas. The Administration's Army modernization program is no exception. Besides budgetary concerns, uncertainties facing the Pact alliance also lead some observers to believe that less aggressive modernization might be acceptable. Two approaches to the present equipment procurement plan are reviewed below. The Congress could, however, decide that implementation of the full program is essential. Accordingly, three options are first examined:

- o Option I--Continuation of current policy,
- o Option II--Reduction in the rate of procurement, and
- o Option III--Modification of the composition of the program.

The Summary Table presents the financial costs and military effects of these options.

Option I--Continuation of Current Policy (the Administration's Plan)

The investment costs of the modernization program, as stated above, are projected to total \$37.6 billion over the next five years, to yield a total improvement in U.S. Army effectiveness of 35 percent. This dollar figure includes the cost of seven major weapons plus \$1.6 billion to "preposition" in Europe two additional division sets of equipment under the POMCUS program; four POMCUS division sets are already prepositioned. The effectiveness of this augmentation of POMCUS would be apparent soon after a mobilization, when it could bring Pact/NATO force ratios down from 1.65:1 to 1.48:1. Later, though, the plan would not alter the present conventional balance of forces, assuming the Pact continued to modernize at current rates. Overall force ratios would still remain above the Army's minimally acceptable 1.5:1 level.

Given current economic conditions, the clearest drawback of the Administration's program is its expense. Along with other programs the Army plans, this modernization would require average increases of more than 6 percent a year (after adjustment for inflation) in the Army's procurement budget. In view of the Administration's many other defense

initiatives, this may be a difficult objective to meet. The Army may have to seek as much modernization as possible but at lower costs.

Option II--Reduction in the Rate of Procurement

One approach could be to continue to procure all the weapons systems included in the Administration's plan but at slower rates over the next five years, and to postpone the expansion of POMCUS as well. This would still serve the objective of furnishing the Army with a more capable arsenal, but it would delay completion of the program. As outlined here, this option would limit most procurement to minimum economical production quantities given current or planned production facilities.

The five-year investment costs of this alternative would total \$31.4 billion. This represents a savings of \$6.2 billion relative to the Administration's program, including \$1.6 billion from delaying the POMCUS additions.

The net improvement in ground combat capabilities over 1980 levels would be 32 percent instead of 35 percent—a modest reduction. Foregoing the two additional POMCUS division sets would limit capabilities in the first days following a mobilization. This would be acceptable, however, to military planners who feel that prepositioning two additional division sets would expose too much equipment to possible attack and would limit U.S. flexibility in deploying forces outside Europe.

Another drawback to this option is that the unit costs of equipment would rise, because savings that normally come with production experience would be delayed, and because certain numbers of units would be produced later, when inflation has pushed up costs. Unit costs of the M1 tank, for example, could increase by about 6 percent under this option. Moreover, this option runs counter to one of the Defense Department's key initiatives, which has been to maintain production rates at high levels.

Option III--Modification of the Composition of the Program

Adjusting the program's composition could sustain procurement of several major armor and anti-armor systems at high rates while delaying others to achieve budgetary savings. Those that might be deferred are two that are not ground attack systems—the DIVAD gun and AHIP, which some planners feel warrant lower priority. The Army could, of course, choose to delay other systems and still cut costs. As in Option II, this alternative would also delay the addition of two POMCUS division sets of equipment.

The investment costs of this option would total approximately \$31.2 billion—a savings of \$6.4 billion over the Administration's plan.

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Since neither the DIVAD gun nor AHIP is a ground attack system, the effectiveness analysis used by CBO cannot quantify the results of this option in force ratios. But clearly, the Army would risk some reduction in capabilities regarding air defense by not deploying DIVAD, and in aerial target location and designation from its loss of AHIP. The Army would have to rely on weapons now in the force for these missions.

In the case of the DIVAD gun, however, some critics argue that Soviet developments will be able to overcome the gun's capabilities by the time it is fielded. This suggests that relying on existing equipment while better air defense is developed might be acceptable in a period of strict budgetary restraint. In the case of AHIP, the Army could end up putting an expensive modification on an old scout helicopter even though it currently has ongoing a research and development effort for a new scout helicopter that would be ready for procurement in the early 1990s.

THE COSTS OF MEETING MINIMUM OPTIMAL FORCE RATIOS

The Administration's modernization program, and of course the lower-cost alternatives, would fail to meet the minimum 1.5:1 force ratio that Army doctrine regards as preferable. Some observers believe that a substantially greater commitment to conventional forces is necessary. Even though a program that would actually reverse the current Pact advantage seems unlikely in the present economic climate, knowing its costs might prove useful to the Congress.

As a first step toward improving conventional force ratios, the Congress could modernize Army forces at the maximum rates possible with current or planned facilities. This approach would also proceed with the Administration's plan for POMCUS expansion. These steps alone, however, would still not permit NATO to meet the desired 1.5:1 ratio.

To do so, the United States would also have to add two fully supported armored divisions, increasing the Army's active divisions from 16 to 18. The other NATO allies, too, would have to make proportionate increases in the size of their forces. Moreover, they would have to embark on aggressive modernization programs to improve the firepower of their existing divisions to levels consistent with those in U.S. divisions.

Such rapid modernization on the part of the United States, plus the addition of two armored divisions, would be expensive. Over the next five years, the total investment costs (taking into account only the weapons systems considered here) would equal \$45.6 billion—some \$8 billion more than the Administration's plan. Since it would be impossible with current

SUMMARY TABLE. COSTS AND COMPLETION DATES OF GROUND COMBAT MODERNIZATION UNDER THREE OPTIONS

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Total Costs		Percent	Year	Percent
1983-1987		Modernized	When	Improvement in
(In billions	,	Through	Modernization	Overall Force
of dollars)	System	1987	Complete	Capability
	Option	I. Administ	tration Program	;
37.6	Ml Tank	96	1988	35
	FVS	63	1990	
	MLRS	100	1986	
	AH-64	37	1995	
	DIVAD Gun	100	1987	
	AHIP	36	1991	
31.4	M1 Tank FVS MLRS AH-64 DIVAD Gun AHIP	75 52 100 37 86 36	1990 1993 1986 1995 1988 1991	32
	Option III.	Modified Pr	ogram Composi	tion
	Ml Tank	96	1988	<u>b</u> /
31.2		63	1990	
31.2	FVS	0)		
31.2	FVS MLRS	100	1986	
31.2			1995	
31.2	MLRS	100 37		

SOURCE: Congressional Budget Office.

- a. Requirements are based on CBO estimates.
- b. Force effectiveness analysis, which reflects ground attack systems only, yields no numerical result from this option, which would defer procurement of AHIP and DIVAD gun.

or planned facilities to carry out a rapid modernization and equip two new divisions by the end of 1987, an additional \$4.5 billion would be needed in 1988 and 1989.

Over the next five years, another \$17 billion would be associated with basing and operating the two new divisions. Base construction would cost \$4.7 billion. Adding the needed 100,000 more troops would cost \$6.7 billion, assuming that the increases were phased in at steady annual rates. This amount would cover not only pay and allowances, but also additional recruiting incentives needed to get more recruits while keeping recruit quality high in the all-volunteer force. Finally, the costs of supplies and other operating expenses would total \$5.6 billion over the five-year period.

LONG RUN COSTS OF MODERNIZATION— SUPPORT AND MAINTENANCE

The full costs of the Administration's modernization program include not only the investment costs that are the main focus of this study but also the costs to operate and support the new equipment once it is fielded. In general, greater sophistication generates higher maintenance and support costs. Though less visible than the procurement costs, these expenses could increase the Army's future operating budget substantially. Projected increases in the consumption of fuel and of more expensive repair parts play a large part.

With the fielding of the M1 tank--rather than its predecessor, the M60A1--the cost to operate and support a tank battalion is estimated to increase by as much as 41 percent. As the FVS is introduced, the cost to operate and support the mechanized infantry battalion is estimated to increase by as much as 59 percent. In most cases, the CBO has used data consistent with the Army budget to project the recurring costs to operate and support the modernized tank and mechanized infantry battalions. The Army, however, uses other data and assumptions, and it concludes that the increase in costs would be somewhat lower.

By the end of the five-year projection period, the annual cost (in 1983 dollars) to operate and support these modernized tank and mechanized infantry battalions would increase by \$1.1 billion. When all of the tank, mechanized infantry, and support battalions are modernized, the added annual costs could total approximately \$1.5 billion. By 1987, this represents an increase of 46 percent above the \$2.4 billion spent today to operate these battalions, but an increase of only 6.5 percent above the Army's total 1983 budget request for operations and maintenance.

ARMY GROUND COMBAT MODERNIZATION

FOR THE 1980s:

POTENTIAL COSTS AND EFFECTS FOR NATO

CHAPTER I. INTRODUCTION

In the judgment of the U.S. Department of Defense, the member nations of the Warsaw Pact--principally, the Soviet Union--possess certain critical military advantages over the NATO alliance. 1 Not only do Pact ground troops vastly outnumber NATO's; Pact equipment is also held to be superior in both quality and quantity. Whereas much of the Soviet materiel now deployed was designed and built as recently as the late 1970s with high technological sophistication, most of the equipment the United States now has dedicated to the defense of Western Europe dates back to the early 1970s and even the 1960s.

THE PERCEIVED WARSAW PACT THREAT

Defense Department planning rests on the assumption that the forces of the Warsaw Pact pose the only significant threat to NATO. What combination of factors might prompt the Pact nations to launch an attack against NATO is unclear, but in the view of the Defense Department, the risk requires that NATO be prepared to perform effectively in the most demanding military scenario. Furthermore, NATO may be concerned about the role of military power in discouraging any attempt on the Soviets' part to expand their political influence, both in Europe and elsewhere.

Since the mid-1970s, however, the balance of conventional forces in the Central Region of Europe has become increasingly unfavorable to NATO because of gains in Warsaw Pact strength. These improvements include continued modernization of ground combat equipment and increases in the existing force structure. Those developments have spurred U.S. efforts to update major Army combat equipment. A goal of several previous Administrations, Army modernization first took material form under President Carter with the procurement of several new weapons systems in 1978.

The 16 member nations of NATO are Belgium, Canada, Denmark, the Federal Republic of Germany, France, Great Britain, Greece, Iceland, Italy, Luxembourg, Norway, Portugal, the Netherlands, Spain, Turkey, and the United States. The seven members of the Warsaw Pact are Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland, Romania, and the Soviet Union.

THE CURRENT MODERNIZATION PLAN

Continuing this course, the Reagan Administration has committed substantial resources to a major program to improve the effectiveness of the U.S. Army's combat forces by procuring nine major new weapons systems. Though secondary concerns in the Middle and Far East also motivate the Administration's modernization effort (non-NATO contingencies were also key in the previous Administration's defense planning), the primary concern focuses on the military balance in Europe and on defending NATO. The total cost for major systems in the modernization program, if it is fully implemented and completed within the time envisioned, is estimated by the Administration to be \$46 billion over the fiscal year 1983-1987 period. 2/

In view of the size of this fiscal commitment, the extreme constraints now affecting the federal budget, and the presumed urgency of the Army's need, the design and costs of the Administration's program warrant assessment. What would the program accomplish? Would it effectively meet its stated goals? Could the same—or at least adequate—effectiveness be purchased for any significantly smaller sum? And at the same time, were the federal budget not so hard pressed, what would be entailed setting even higher standards for NATO's defense?

The scope of this Congressional Budget Office study, intended to help weigh military commitments against capabilities, is confined to seven of the nine proposed new weapon systems—those that would serve U.S. Army ground forces in conventional (that is, nonnuclear) combat mainly in Europe. Procurement costs of these systems (including one missile) have been set by the Administration at \$36 billion over the five-year period examined. (The \$10 billion difference is accounted for by procurement of an air defense missile system and two helicopter programs not considered in this study. The Army is also developing a missile system as part of the tactical nuclear force modernization program; the details and costs of this program are classified secret for reasons of national security.)

Of course, implementation of an arms control agreement would significantly alter NATO's security concerns. Force reductions in Europe, such as those being considered in the ongoing Mutual and Balanced Force

^{2.} This analysis assumes a lag of up to 24 months between the time a weapon is ordered and its delivery-commonly referred to as the funded delivery period. The \$46 billion estimate represents the cost of major weapons systems included in the Defense Department's Selected Acquisition Report of June 30, 1982. This estimate excludes the costs for the Copperhead projectile, which was cancelled, and the Pershing II missile system.

Reductions (MBFR) negotiations, would accomplish an important step in enhancing NATO's security, so long as the current imbalance of forces is not codified. Such reductions, coupled with limits on the pace of Warsaw Pact modernization, clearly would lessen a perceived urgency for U.S. Army modernization.

THE U.S. ARMY TODAY

Though the United States must be prepared to meet challenges in such distant theaters as the Persian Gulf or Korea, the defense of Europe remains the cornerstone of U.S. national security policy. 3/ Together with those of other NATO allies, the United States' forces are conceived as a deterrent against attack by the Warsaw Pact forces. Should deterrence fail, however, all 16 member nations of NATO are pledged to regard an attack on one as an attack on all. Accordingly, each member is committed to assign defense forces to the NATO military command if a war should occur. Contributing to the defense of Europe, therefore, remains the Army's primary mission.

Manpower Configurations

To meet its commitments, the Army currently has approximately 784,000 troops on active duty and another 686,000 reserve personnel. Army personnel on active duty are organized into 16 divisions, each of which usually consists of 16,000 to 18,000 troops. There are also separate brigades and regiments, most of which have 4,000 to 5,000 troops. These combat divisions are complemented by numerous support forces ranging from maintenance and support units to medical units. (Appendix A gives a detailed review of the Army's organization.)

In addition, the Army has 686,000 reserve personnel who drill regularly either in the Army National Guard or the Army Reserve. The reserves are organized into eight divisions plus many separate brigades and smaller units.

^{3.} The establishment under the Carter Administration of the Rapid Deployment Force (RDF)--with 100,000 troops to be available from all services--reflects increasing concern about requirements for military operations outside of Europe. Since no new combat forces are now planned for the RDF, the existing reservoir of forces would be drawn upon in the event of a non-NATO action. Thus, should the RDF be dispatched to Southwest Asia, for example, these ground troops would be unavailable for simultaneous combat in Europe.